# Radiative transfer for Type Ia supernovae – bridging the gap between explosion models and observations


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**Abstract:** Type Ia supernovae (SNe Ia) are among the brightest objects in the Universe. Since their peak luminosity can be derived from distance independent light curve properties by an empirical relationship, they can be used as “standard candles” to measure cosmological distances. This led to the discovery that the present-day Universe undergoes an accelerated expansion. Although the common picture that SNe Ia derive from thermonuclear explosions in the electron-degenerate matter of a White Dwarf emerged in the middle of the last century, the exact nature of these objects and the explosion mechanism(s) remain uncertain since no progenitor systems were detected so far. From a theoretical point-of-view several progenitor scenarios have been proposed. This casts a shadow on our understanding of these objects and their use as “standard candles”. Radiative transfer simulations bridge the gap between hydrodynamical explosion models and post-explosion observational data thus allowing us to discriminate between different progenitor scenarios. I will present a new multi-dimensional time-dependent radiative transfer code to address this problem and show first applications to test the outcome of different state-of-the-art explosion models against observations.